

Neutrophil-lymphocyte index, platelet-lymphocyte index and systemic inflammation-immunity index in patients with Covid-19 pneumonia in Veracruz, Mexico.

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Result of the measurement of demographic and clinical variables.	
Variable	Results*
n = 100	
Demographic variables	
Age, years	49.4 (19.3)
Gender; n (%)	
Women	54 (54)
mens	46 (46)
Laboratory variables	
Leukocytes, cel / mm3	10,103.0 (4,289.0)
Neutrophils, cel / mm3	8,509.3 (4,216.0)
Lymphocytes, cel / mm3	1112.7 (585.4)
Platelets, cel / mm3	258,548.0 (127,947.2)
Hematological severity indices	
Neutrophil / lymphocyte ratio	10.7 (10.9)
Platelet / lymphocyte index	290.1 (229.2)
Immune index-systemic inflammation, x 109	2.6 (3.4)
Type of COVID-19 pneumonia, n (%)	
Mild pneumonia	54 (54)
Severe pneumonia	46 (46)
Hospital outcome, n (%)	
Improvement	75 (75)
Death	25 (25)

* Results expressed in means with standard deviation (± SD), except when otherwise indicated

Study group for the diagnosis and treatment of COVID-19 in Veracruz, Mexico

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Background

Different indices have been devised that attempt to correlate the severity of the symptoms and predict mortality mainly in septic states and inflammation, with important results that validate their usefulness. In the present pandemic, to date, no indices have been used in severe cases of Covid- 19 that can predict the outcome.

Methods

It includes a cohort of patients with pneumonia confirmed by Sars Cov 2 PCR-RT, treated at the Veracruz Norte branch of the Instituto Mexicano del Seguro Social from April to May 2020, analyzing the neutrophil-lymphocyte, platelet-lymphocyte and immunity-systemic inflammation indices.

Results

We included 100 patients, 54 (54%) women and 46 (46%) men, with a mean age of 49.4 ± 19.3 years. The mean of leukocytes was 10,103.0 ± 4,289.0 cel / mm3, neutrophils 8,509.3 ± 4,216.0 cel / mm3 and lymphocytes of 1,112.7 ± 585.4 cel / mm3; Regarding the hematological indices used to measure severity, we found that the mean of the INL was 10.7 ± 10.9, that of the IPL was 290.1 ± 229.2 and that of the IIIS was 2.6 ± 3.4 x 109. Regarding the type of pneumonia, 54 (54%) had mild pneumonia and 46 (46%) had severe pneumonia. Regarding hospital outcomes, 75 (75%) of the patients were discharged due to clinical improvement and 25 (25%) of the patients died during the hospital stay. The mean age was significantly higher in the group of patients who died during the hospital stay (45.9 ± 18.6 VS 60.0 ± 17.5 years, p = 0.001), the proportion of women who died was higher and tended to be statistically significant. The mean INL was 20.4 ± 16.9 in patients who died VS 7.5 ± 4.9 in patients who improved (p = 0.001). The mean IPL was 417.1 ± 379.7 in patients who died VS 247.7 ± 127.4 in patients who had improvement; p = 0.038. Finally, the mean IIIS was significantly higher in patients who died VS patients who had clinical improvement (4.8 ± 6.1 VS 1.9 ± 1.2; p = 0.030, respectively). In the correlation analysis, high and significant r were found in the three indices.

Conclusion

Neutrophil-lymphocyte, platelet-lymphocyte and systemic immunity-inflammation indices in patients with Covid-19 pneumonia can be used as predictors of severity and predict hospital outcome.

Comparative analysis of the variables studied stratified by hospital outcome			
Variable*	Improvement	Death	p
Demographic variables			
Age, years	45.9 (18.6)	60.0 (17.5)	0.001§
Gender, n (%)			
Women	45 (60.0)	9 (36.0)	0.063*
mens	30 (40.0)	16 (64.0)	0.063*
Laboratory variables			
Leukocytes, cel / mm3	9,594.1 (3,190.4)	11,629.6 (6,423.6)	0.139§
Neutrophils, cel / mm3	7,856.8 (3,093.6)	10,466.8 (6,204.1)	0.053§
Lymphocytes, cel / mm3	1,274.0 (544.5)	628.8 (419.3)	0.001§
Platelets, cel / mm3	275,450.6 (113,072.5)	207,840.0 (156,637.7)	0.021§
Hematological severity indices			
Neutrophil / lymphocyte ratio	7.5 (4.9)	20.4 (16.9)	0.001§
Platelet / lymphocyte index	247.7 (127.4)	417.1 (379.7)	0.038§
Immune index-systemic inflammation, x109	1.9 (1.2)	4.8 (6.1)	0.030§
Type of COVID-19 pneumonia, n (%)			
Mild pneumonia	54 (72.0)	0 (0.0)	0.001*
Severe pneumonia	21 (28.0)	25 (100.0)	0.001*

* Results expressed in means with standard deviation (± SD), except when otherwise indicated.
 §T of Student; £ Chi Square with Fisher's exact test

Correlation analysis of severity hematological variables with hospital outcome.

Variables n = 100	Female gender	Age	Neutrophil-lymphocyte index	Platelet-lymphocyte index	Systemic inflammation-immunity index	Severe pneumonia	Death
Gender	1.000						
r							
p							
Age	0.060§	1.000					
r	0.552						
p							
Neutrophil-lymphocyte index	0.625£	0.185£	1.000				
r	0.521	0.660					
p							
Platelet-lymphocyte index	-0.068§	0.030£	0.441£	1.000			
r	0.501	0.771	0.001				
p							
Systemic inflammation-immunity index	-0.033§	0.097£	0.737£	0.705£	1.000		
r	0.742	0.338	0.001	0.001			
p							
Severe pneumonia	0.155*	0.512£	0.523£	0.182£	0.204£	1.000	
r	0.125	0.001	0.001	0.069	0.042		
p							
Death	0.209*	0.321§	0.533§	0.199§	0.176§	0.626§	1.000
r	0.037	0.001	0.001	0.047	0.079	0.001	
p							

§ Spearman's correlation

£ Pearson's Correlation

* Phi correlation